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REFERENCE MAP OF
THE UNITED STATES
COMPLIMENTS OF
The American Society of
Civil Engineers
1893





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Book A 55

Capt. W. S. Bixby.
Corps of Engineers, U. S. Army,



*American Society of Civil Engineers, New
York, Committee on information and cour-*

INSTITUTED 1852.

tesy.

NOTE.—This Society is not responsible as a body for the facts and opinions advanced in any of its publications.

List of Prominent Structures and Works in connection with
the accompanying reference map of the United States
of America, prepared by the COMMITTEE ON
INFORMATION AND COURTESY OF THE AMERI-
CAN SOCIETY OF CIVIL ENGINEERS.

HOUSE OF THE SOCIETY,
No. 127 EAST 23RD STREET, NEW YORK.

1893.

TA23
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AMERICAN SOCIETY of CIVIL ENGINEERS.

OFFICERS FOR 1893.

President, WILLIAM METCALF.

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CHARLES B. BRUSH,

SAMUEL WHINERY.

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Assistant Secretary, CHARLES WARREN HUNT.

Audi'or, THOMAS B. LEE.

MEETINGS.

Regular Meetings. on the first and third Wednesdays of the month,
at 20 o'clock, except during July and August.

The rooms of the Society are open from 9 to 17 o'clock each business
day, except Saturday (when they are closed at 13 o'clock), and at other
times on application to the Janitor.

HOUSE OF THE SOCIETY—127 E. TWENTY-THIRD ST., NEW YORK.

Engineers School Liby,

June 28, 1931

B. 3. 5. 18 Dec. 31.

The following lists are not intended to be exhaustive of the great number of manufactures and public works in this country, but are offered as a general guide to our foreign visitors who may desire to investigate particular subjects and processes. The addresses given are of engineers and manufacturers who have kindly offered their establishments for the inspection of visiting engineers when properly introduced.

The Committee of Information and Courtesy.

EDWARD P. NORTH,

LEFFERT L. BUCK,

FOSTER CROWELL.

Marginal figures refer to accompanying map.



GENERAL INFORMATION.

The following named organizations have appointed Committees to co-operate with the American Society of Civil Engineers in affording information to visiting engineers :

At **Chicago**, visitors are requested to register their names as soon as convenient at the rooms of the General Committee of Engineering Societies, No. 10 Van Buren street.

At **Boston**, Massachusetts, The Boston Society of Civil Engineers, S. E. Tinkham, Secretary, City Hall.

THE NEW ENGLAND WATER WORKS ASSOCIATION, R. C. P. Coggeshall, Sec'y, NEW BEDFORD, Mass.

At **BUFFALO**, N. Y., visiting engineers should apply to Edw. B. Guthrie in the Department of Public Works.

Visitors to **NIAGARA FALLS**, desiring to see the Hydraulic Works and Tunnel of the Niagara Falls Power Co., will call on Dr. Coleman Sellers, Cataract House, Niagara Falls. Geo. B. Burbank, Cataract Construction Company's Office, Niagara Falls.

At **PHILADELPHIA**, Pennsylvania, application should be made to The Engineers' Club, 1122 Girard street; and the Swedish Engineers' Club of Philadelphia, J. A. Tillner, Sec'y, 646 North 10th street.

At **WASHINGTON**, application can be made between 9 and 4 o'clock to Mr. Henry Gannett, U. S. Geological Survey, 1330 F st., N. W.; or from 9 to 5 at office of Chief Engineer of Richmond and Danville R. R., Channing M. Bolton, 1300 Pennsylvania Ave.; and from 6 to 10 P. M. to Prof. Francis R. Fava, Jr., Columbian University, 15th and H sts.

At **PITTSBURG**, Pennsylvania, Engineers' Society of Western Pennsylvania and the Chamber of Commerce at Pittsburgh, have appointed Mr. Wm. A. Doak, 421 Wood st.



The Association of Engineers of Virginia at ROANOKE, have appointed Mr. R. H. Soule Supt. of Roanoke Machine Works, as Chairman of Committee.

The ROADMASTERS' ASSOCIATION OF AMERICA is represented by H. W. Reed, Pres., WAYCROSS, Georgia.

At CLEVELAND, Ohio, the Civil Engineers' Club of that city have their headquarters in Room 721, No. 185 Euclid Ave., where Messrs. Osborn or Ritchie will attend to visiting engineers.

At CINCINNATI, Ohio, Col. Latham Anderson, 59 Johnston bldg., President of the Cincinnati Engineers' Club will give information to visiting engineers.

The Ohio Society of Surveyors and Civil Engineers have appointed Chas. A. Judson, of SANDUSKY, Ohio, to co-operate with this Society.

The Indiana Engineers Society of SOUTH BEND, Ind., are represented by Wm. M. Whitten, office of City Civil Engineer.

The Scandinavian Engineering Society of Chicago, Allen Strale, President, will be happy to welcome engineers in Room 309, Title and Trust bldg., 100 Washington st.

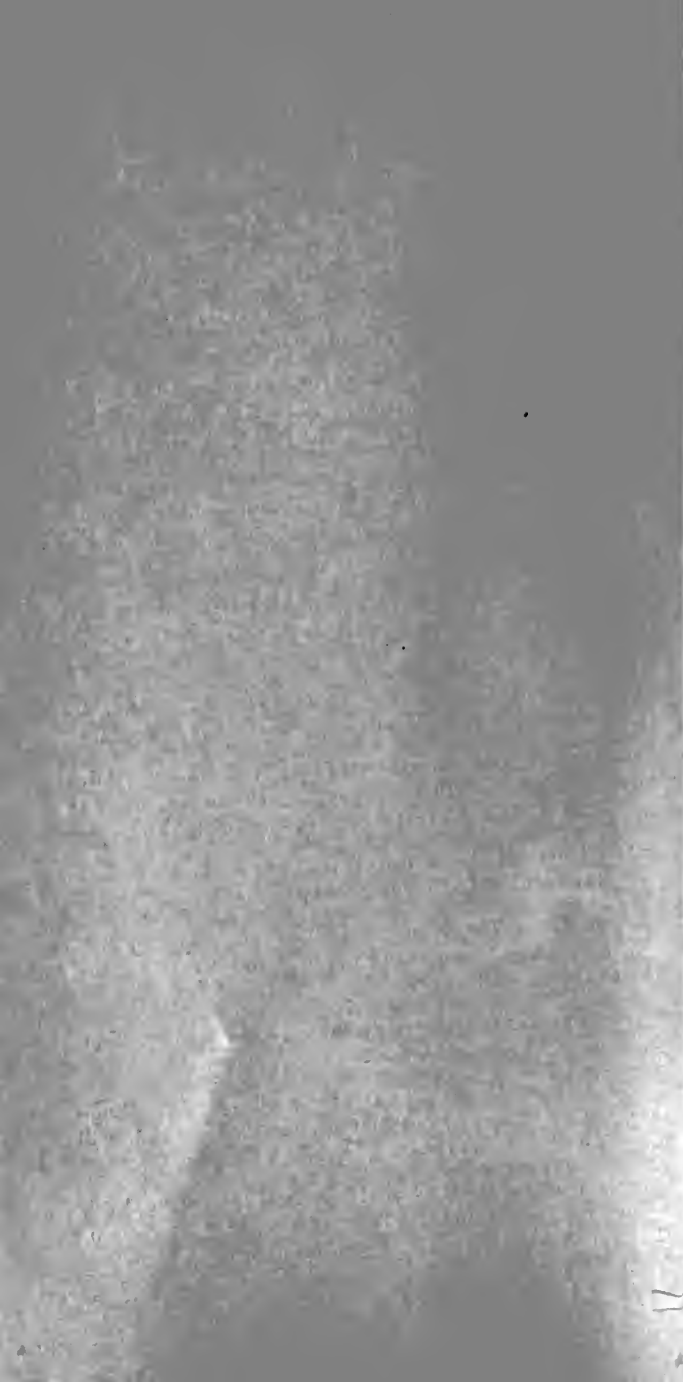
The American Water Works Association. G. H. Benzenberg, President, City Engineer MILWAUKEE, WIS.

At ST. LOUIS The Engineers' Club is represented by Robert Moore, Chief Engineer of ST. LOUIS MERCHANTS' BRIDGE, Laclede bldg.

The KANSAS CITY Engineers' Club is represented by Robt. Gillham, 222 Rialto bldg., Kansas City, Missouri.

At DENVER, Colorado, The Denver Society of Civil Engineers, W. B. Lawson, 504 McPhee Block, President, will give local directions to visiting engineers.

In CALIFORNIA, The Technical Society of the Pacific Coast, Academy Sciences bldg., 819 Market st., SAN FRANCISCO, Otto von Geldern, Secy., are co-operating with us.



At HELENA, Montana, The Montana Society of Civil Engineers, G. O. Foss, Secy., will introduce and direct visiting engineers.

At MINNEAPOLIS and ST. PAUL, Minnesota, application may be made to Messrs. C. F. Loweth and J. D. Estabrooke of St. Paul, or to F. W. Cappelem, City Engineer and Pres. of the Engineers' Club of Minneapolis.

At NASHVILLE, Tennessee, Prof. Olin H. Landreth, Vanderbilt University as the representative of the Engineering Association of the South will give instructions to visiting engineers.

At LOUISVILLE, Kentucky, the Louisville Engineers' and Architects' Club, Norton bldg., 4th and Jefferson sts., M. Morris, President ; H. M. Mobray, Secy., will co-operate with this Society.

RAILROAD MAINTENANCE AND OPERATION.

NEW YORK CENTRAL AND HUDSON
RIVER RAILROAD.

Walter Katte, Chief Engineer, Grand Central Station, N. Y.
Wm. Buchanan, Supt. of Machinery, Grand Cent. Sta., N. Y.

MACHINE SHOPS.

James Buchanan, - - - West Albany, New York.

BLOCK AND SIGNAL SYSTEM.

A. T. Dice, Supt., - - - Grand Central Station.

NEW YORK, LAKE ERIE AND WESTERN RAILROAD.

Aug. Mordecai, Chief Engineer, - 21 Cortlandt st., N. Y.
H. J. Howe, Roadmaster, - - - Galion, Ohio.

PENNSYLVANIA RAILROAD.

Theodore N. Ely, Chief of Motive Power,
233 So. 4th st., Philadelphia, Pa.

ALLEGHENY VALLEY RAILWAY COMPANY.

F. M. Ashmead, Engineer, - - - Pittsburg, Pa.

RICHMOND, FREDERICKSBURG & POTOMAC R. R.
RICHMOND & PETERSBURG R. R. CO.

AND

PETERSBURG RAILROAD COMPANY.

E. T. D. Myers, Gen. Supt. Byrd Street Station,
Richmond, Virginia.

CHESAPEAKE AND OHIO RAILROAD CO.

S. Von Gemmingen, Asst. Engineer, Richmond, Virginia.

WHEELING & LAKE ERIE RAILWAY CO.

C. A. Wilson, Gen. Supt., - - - Toledo, Ohio.



CHICAGO & NORTHWESTERN RAILROAD CO.

C. Palmer, Engineer, - - - Escanaba, Michigan.

MICHIGAN CENTRAL RAILROAD COMPANY.

Benj. Douglas, Bridge Engineer, - Detroit, Michigan.

NORTHERN PACIFIC RAILROAD COMPANY.

K. E. Hilgard, Engineer of Bridges
Grand Central Passenger Station, Chicago, Ills.

BALTIMORE AND OHIO RAILROAD.

W. L. Sisson, Resident Engineer, Harper's Ferry, West Va.

MACHEN, GEORGIA & ALABAMA RAILROAD.

Arthur Pew, Chief Engineer, - - - Machen, Ga.

SOUTHERN PACIFIC COMPANY.

W. G. Curtis, Asst. to Gen. Mgr., - San Francisco, Cal.

RIO GRANDE SOUTHERN RAILROAD CO.

C. W. Gibbs, Chief Engineer, - Ridgeway, Colorado.

UNION PACIFIC RAILWAY.

G. H. Pegram, Chief Engineer, - Omaha, Nebraska.

CHICAGO, ROCK ISLAND & PACIFIC RAILWAY CO.

Geo. H. Boynton, Asst. Engineer, - Davenport, Iowa.

TERMINAL RAILROAD ASSOCIATION OF ST. LOUIS.

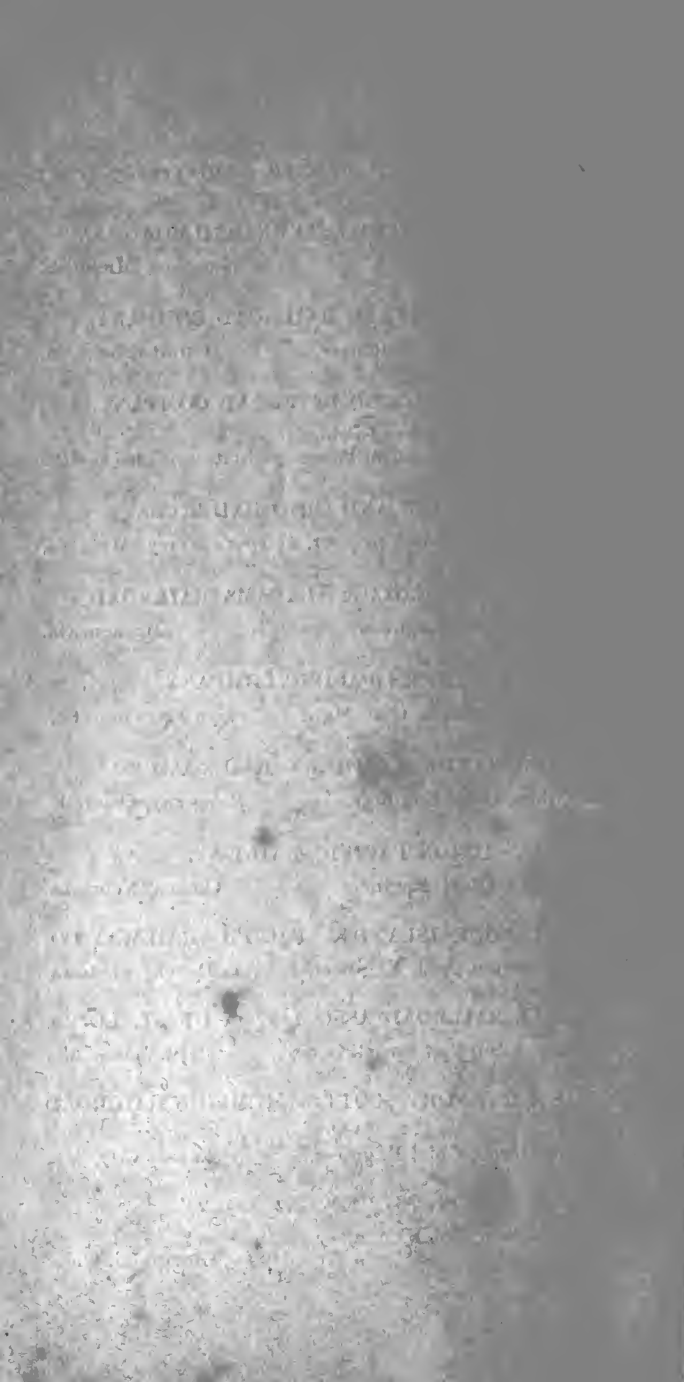
N. W. Eayrs, Supt. of Structure, etc., - St. Louis, Mo.

**KANSAS CITY, FORT SCOTT & MEMPHIS RAILROAD
CO.**

Daniel Bontecou, Chief Engineer, - Kansas City, Mo.

QUEEN & CRESCENT ROUTE.

G. B. Nicholson, Chief Engineer,
35 West 4th st., Cincinnati, Ohio.



RIVER AND HARBOR WORKS UNDER THE DIRECTION OF OFFICERS OF U. S. ENGINEER CORPS.

Col. Peter C. Hains, U. S. Engineer's Office, Portland, Maine.
Sea Coast Harbors.

Wm. P. Judson, Assistant Engineer, Oswego, N. Y., 76.5 43.5
Lake Harbor, Timber Break Water, Submarine Rock
Excavation.

Col. Wm. P. Craighill,
9 Pleasant St., Baltimore, Md., 76.7 39.2
Sea Coast Harbor and River Improvement.

Capt. F. V. Abbott, - - Charleston, S. C., 79.9 32.9
Harbors and Rivers.

Emil Diebitsch, Assistant Engineer,
Timber Dry Dock, Port Royal, S. C., 80.6 32.4

W. G. Williamson, Assistant Engineer,
Muscle Shoals Canal, Wheeler, Ala.
South Pass Jetties, - - Mississippi River, 89.2 29.1

W. J. Sherman, Gen. Manager and Engineer,
Galveston Harbor Jetty, Galveston, Texas, 94.7 29.2
Wilmington Harbor, - - San Pedro, Cal., 118.3 33.4
Yaquina Bay, - - - Newport, Oregon, 124.1 44.7
Columbia River, - - Astoria, Oregon, 124. 46.2

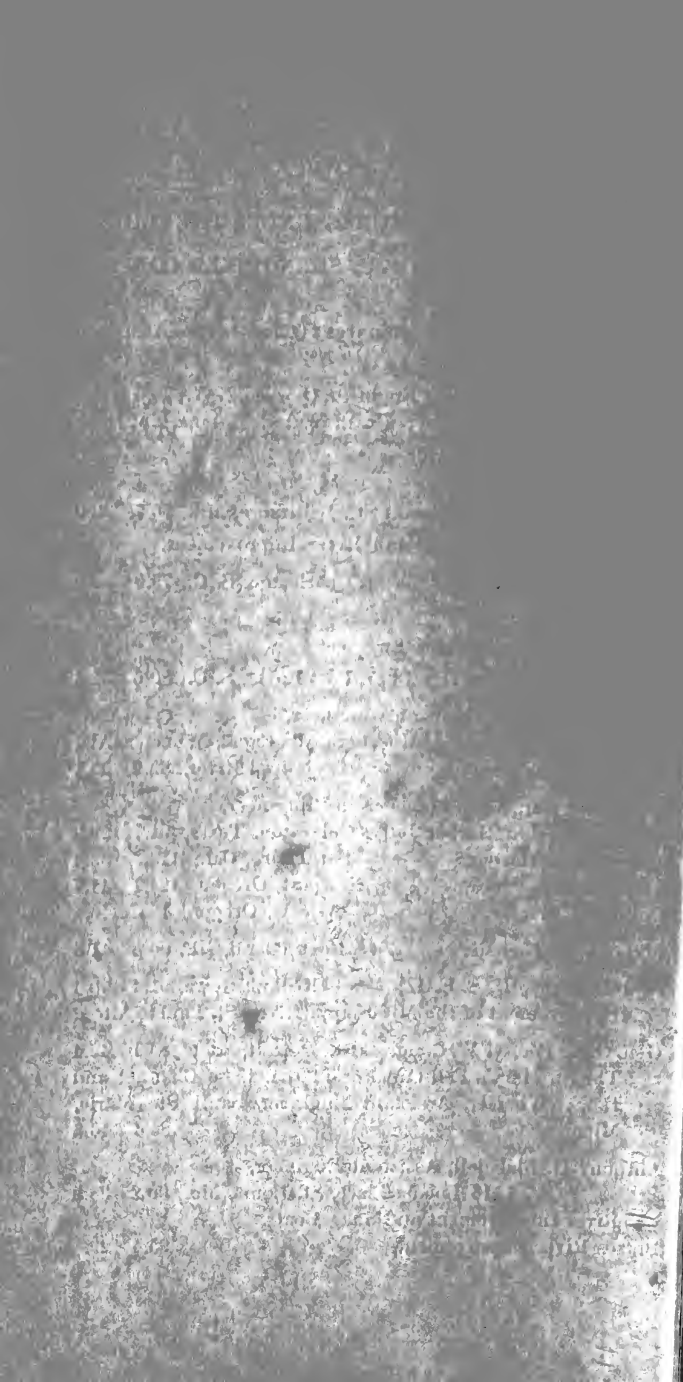
Major A. Mackenzie, - - Rock Island, Ill., 90.6 41.5

And M. Meigs, U. S. C. E., - Keokuk, Iowa, 91.4 40.4
Improvement of the Mississippi River, St. Paul to Alton.

Gen. O. M. Poe, 34 W. Congress St., Detroit, Mich., 83.1 42.4
The St. Mary's Fall Canal and 20 ft. Lake Channel and
E. S. Wheeler, Assistant Engineer, Sault Ste Marie,
Mich., - - - - - 84.4 46.5

Anthony H. Blaisdell, Assistant Engineer,
1515 Locust Place, St. Louis, Mo., 90.2 38.3
River Improvement and Snag Boats.

Brazos River Improvement, - - - - 95.4 29.



NOTE.—Works which are being built are marked u. c.

BRIDGES.

Brooklyn Bridge.

C. C. Martin, Engineer.

G. Leverich, Engineer, 179 Washington St., Brooklyn.

Washington Bridge, - - Harlem River, 73.8 40.8

High Bridge (Aqueduct), - - Harlem River, 73.8 40.8

N. Y. C. & H. R. R. R. Bridge, u. c., Harlem River, 73.8 40.8

Walter Katté, Engineer, Grand Central Station, New York.

Geo. H. Thomson, Bridge Engineer.

Viaduct, u. c., - - - 155th St. and Harlem River.

Martin Gay, Engineer.

Bridge, u. c., - Harlem Canal and King's Bridge Road.

Wm. H. Burr, Engineer.

NOTE.—Over the Harlem in this vicinity are several other interesting types of bridge construction.

Poughkeepsie Bridge, - Hudson River, N. Y., 73.9 41.7

Cabin John (Aqueduct) Bridge,

Potomac Valley, Washington, D. C., 77.1 38.9

Niagara, R. R. Suspension, Niagara Falls, N. Y., 79. 43.1

Niagara Cantilever, - Niagara Falls, N. Y., 79. 43.1

Niagara Carriage Suspension, Niagara Falls, N. Y., 79. 43.1

Waterford (Wooden), - - Waterford, N. Y., 73.8 43.

Portage Bridge, N. Y., L. E. & W. R. R., N. Y., 78.1 42.5

Kinzua Viaduct, - B., N. Y. & P. R. R., Pa., 79. 41.8

Connecting Bridge, - Ohio River, Pittsburg, Pa., 80. 40.4

Smithfield St. Bridge,

Monongahela River, Pittsburg, Pa., 80. 40.4

Point Bridge, Monongahela River, Pittsburg, Pa., 80. 40.4

Sixth St. Bridge, Allegheny River, Pittsburg, Pa., 80. 40.4

Seventh St. Bridge, Allegheny River, Pittsburg, Pa., 80. 40.4

NOTE.—In Pittsburg are other interesting types of bridges.

Cincinnati Suspension Bridge, Ohio River, Cin., 84.6 39.1

Cin. Southern R. R. Bridge, - Ohio River, Cin., 84.6 39.1

Ches. & Ohio R. R. Bridge, Ohio River, Cin., 84.6 39.1

Newport Highway Bridge, - Ohio River, Cin., 84.6 39.1

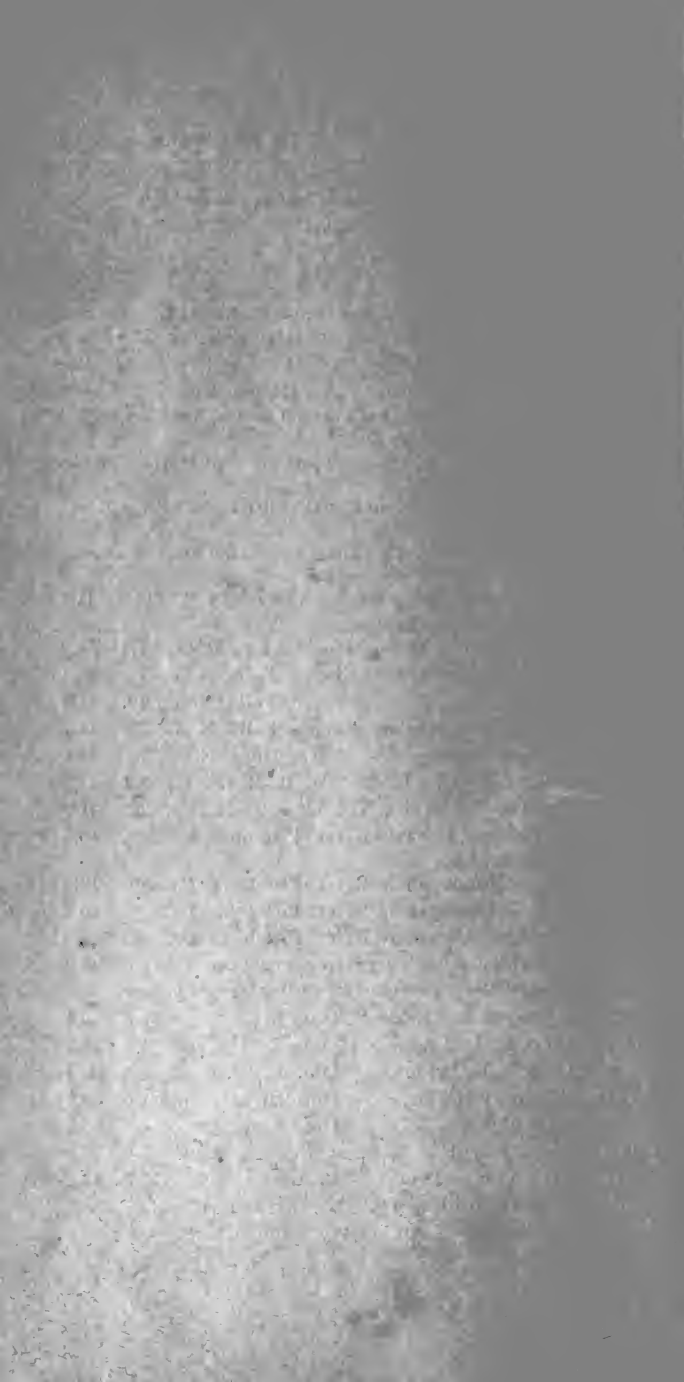
Short Line Bridge, - - Ohio River, Cin., 84.6 39.1

Oakley Skew Arch, P. C. C. & St. L. R. R., Cin., 84.6 39.2

Driving Park Avenue Bridge, - Rochester, N. Y., 77.7 43.2

Louisville (Fink) Bridge, Ohio River, Louisville, 85.7 38.2

Sand Island Bridge, - Ohio River, New Albany, 85.8 38.2.



Louisville and Jeffersonville, u. c.,		
Ohio River, Louisville,	85.7	38.2
Kentucky River Cantilever (C. Shaler Smith's),		
Cin. Southern Ry., Ky.,	84.7	37.8
Henderson Bridge, Ohio River, Henderson, Ky.,	87.5	37.9
Bellefontaine Bridge, u. c., Alton, Ills.,		
Missouri River,	90.2	38.8
Eads' Bridge, - Mississippi River, St. Louis,	90.2	38.6
N. W. Eayrs, Supt.		
Merchants' Bridge, Mississippi River, St. Louis,	90.2	38.7
Cairo Bridge, - - - Ohio River, Cairo,	89.2	37.1
Memphis Bridge, - Mississippi River, Memphis,	90.1	35.1
Pecos River Viaduct, - - - - -	103.6	31.4
Minneapolis Stone Arch Viaduct,		
Mississippi River, Minneapolis,	93.3	45.
Minneapolis Steel Arch Bridge		
Victoria Bridge, - St. Lawrence River, Montreal,	73.6	45.4
Lachine Bridge, - - Coteau, C. & A. R. R.,	74.1	45.2
Street Lift Bridge, - - - - - Chicago River.		
Bismarck Bridge, N. P. R. R., Bismarck, N. Da.,	100.8	46.8
Relay House Viaduct,		
Patapsco River, B. & O. R. R.,	76.7	39.1
Natural Bridge, Va., - - - - -	79.5	37.6
Combination Bridges, Cascade Div. N. P. R. R., Washington.		
Harper's Ferry Bridge, u. c.,		
Harper's Ferry, B. & O. R. R.,	77.7	39.3
W. L. Sisson, Engineer.		
Thames River, New London, Conn., - -	41.3	72.1

TUNNELS.

Hudson River Tunnel (partly constructed),		
Hoboken, N. J.,	73.9	40.6
W. R. Hutton, Engineer, 35 Broadway.		
Bergen, D. L. & W. R. R., - Hoboken, N. J.,	74.	40.6
Bergen, Erie R. R., - - Jersey City, N. J.,	74.	40.6
Weehawken, West Shore R. R., Weehawken, N. J.,	74.	40.7
Palisades, N. Y. S. & W. R. R., u. c.,		
Weehawken, N. J.,	74.	40.7
C. E. Broadhead, Engineer and Contractor.		
Hoosac Tunnel. - - North Adams, Mass.,	72.7	42.7
Baltimore and Potomac Tunnel, Baltimore, Md.,	76.7	39.2
Baltimore Belt R. R. Tunnel, - Baltimore, Md.,	76.7	39.2



Niagara Power Co.'s Tunnel, Niagara Falls, N. Y.,	79.	43.1
St. Clair Tunnel, G. T. Ry., Pt. Huron, Mich.,	82.5	42.9
Summit Tunnel, P. R. R., - Gallitzin, Pa.,	78.7	40.4
Chicago River Street Tunnel, - - Chicago,	87.7	41.8
Chicago Lake Tunnels.		
Sutro Mining Tunnel, - Virginia City, Nevada,	119.7	39.4
Milwaukee Water Works, Tunnel, Milwaukee, Wis.,	87.9	43.1
Stampede Pass Tunnel, - N. P. R. R., Cascade Div.		
Mullan Tunnel, - N. P. R. R., Helena, Mont.,	112.1	46.6
Natural Tunnel, - - - - - Clinchport, Va.		
Harper's Ferry, u. c., - - - - -	77.7	39.3
W. L. Sisson, Engineer.		

ELEVATED RAIL ROADS.

Manhattan, - - - - -	New York.	
John Waterhouse, Engineer, 71 Broadway.		
Brooklyn, - - - - -	Brooklyn,	73.8 40.6
O. F. Nichols, Engineer, 31 Sand St.		
Weehawken Viaduct, - - Weehawken, N. J.,	74.	40.7
Pennsylvania Rail Road, - Jersey City, N. J.,	74.	40.6
Pennsylvania Rail Road, u. c., Elizabeth, N. J.,	74.1	40.6
Filbert Street, P. R. R., - - Philadelphia,	75.1	40.
Quaker City u. c., - - - Philadelphia,	75.1	40.
C W. Buchholz, Pres't.		
Alley, - - - - -	Chicago.	
R. I. Sloan, Engineer.		
South Side, - - - - -	Chicago.	
Park Avenue Viaduct, N. Y. & H. R. R. R., u. c.,		
	Harlem, N. Y.,	73.8 40.7
Walter Katte, Engineer, Grand Central Station, New York.		
Merchants', - - - - -	St. Louis, Mo.,	90.2 38.7
Detroit Union Depot Viaduct, - Detroit, Mich.,	83.1	42.2

INCLINED RAILWAYS.

Mount Washington (first rack railway built,) N. H.,	71.1	44.3
Pike's Peak (Abt System), Colorado Springs, Col.,	105.3	38.7
Catskill Mountain, - - - - -	74.	42.
Orange Mountain, - - - - -	Orange, N. J.,	74.2 40.8
Penn. Incline, - - - - -	Pittsburg, Pa.,	80. 40.4
Mt. Washington Incline, - - - - -	Pittsburg, Pa.,	80 40.4

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Mt. Auburn Incline, - - -	Cincinnati, O., 84.6	39.1
Eden Park Incline, - - -	Cincinnati, O., 84.6	39.1
Hoboken Electric, - - -	Hoboken, N. J., 74.	40.6
Weehawken Elevators, - - -	Weehawken, N. J., 74.	40.6
Switch Back, - - -	Mauch Chunk, Pa., 75.6	40.8

CABLE RAILWAYS.

Broadway, - - - - -	New York City.	
Geo. W. McNulty, Engineer, 113 West 33th St.		
Third Avenue, u. c., - - - - -	New York City.	
125th Street, - - - - -	New York City.	
Pittsburg, - - - - -	- 80.	40.4
Chicago Lines, - - - - -	Chicago, Ill.	
Cincinnati Lines, - - - - -	84.6	39.1
St. Louis Lines, - - - - -	90.2	38.7
Kansas City, - - - - -	Kansas City, Mo., 94.6	39.
D. Bontecou, Engineer.		
Denver, - - - - -	105.	39.8
San Francisco, - - - - -	122.6	37.7
Cleveland, - - - - -	81.7	41.4

ELECTRIC STREET RAILWAYS.

Boston, - - - - -	71.1	42.3
Brooklyn, - - - - -	73.8	40.6
Philadelphia, - - - - -	75.1	40.
Buffalo, - - - - -	Buffalo, N. Y., 78.9	42.9
Pittsburg, - - - - -	Pittsburg & Allegheny City, 80,	40.4
Cleveland, - - - - -	Cleveland, O., 81.7	41.4
Cincinnati, - - - - -	Cincinnati, O., 84.6	39.1
Louisville, - - - - -	Louisville, Ky., 85.7	38.2
St. Louis, - - - - -	St. Louis, Mo., 90.2	38.7
Kansas City, u. c., - - - - -	Kansas City, Mo., 94.6	39.
D. Bontecou, Engineer.		
Denver, - - - - -	Denver, Col., 105.	39.8
Rochester, - - - - -	Rochester, N. Y., 77.7	43.2
Niagara Park to River R. R., - - -	Clifton, Ont., 79.	43 1

TELEPHONE SERVICE OF NEW YORK.

U. N. Benthall, General Manager, 18 Cortland St., New York.



RAIL ROAD FERRY TRANSFERS.

Jersey City to Port Morris,			
	North and East Rivers, New York.		
Canton, B. & O. R. R.,	-	Baltimore, Md., 76.7	39.2
Chesapeake Bay Transfer,			
	Cape Charles to Norfolk, Va., 76.		36.8
Toledo and Ann Arbor R. R.,			
	Frankfort, Lake Michigan, 86.2		44.7
Detroit, Mich.,	- - - - -	83.1	42.2
Straits of Mackinaw,	- - - Lake Michigan, 84.8		45.9
Ashland,	- - Ohio River, Ashland, Ky., 82.7		38.4
Evansville,	- Ohio River, Evansville, Ind., 87.6		38.
Oakland,	- - - San Francisco, Cal., 122.4		37.7

WIRE ROPE CAR TRANSFER.

Glen Union Station,	P. & E. Division, P. R. R., 77.2	41.3
735 foot span.		

COAL SHIPPING DOCKS.

Hoboken,	- - - - - N. J., 74.	40.7
Buffalo,	- - - - - N. Y., 78.9	42.9
Perth Amboy,	- - - - - N. J., 74.1	40.4
Tacoma,	- - - - - Washington, 122.4	47.2

GRAIN ELEVATORS.

Dow's Stores,	- - South Brooklyn, N. Y., 73.7	40.4
Jersey City, P. R. R.,	- - Jersey City, N. J., 74.	40.6
Jersey City, N. Y., L. E. & W.,	Jersey City, N. J., 74.	40.6
N. Y. C. & H. R. R. R.,	- - - - - New York.	
Point Breeze,	- - - Philadelphia, Pa., 75.1	39.9
Canton,	- - - Baltimore, Md., 76.7	39.2
Erie,	- - - Erie, Pa., 80.	42.1
Buffalo,	- - - Buffalo, N. Y., 78.9	42.8
Duluth,	- - - Duluth, Minn., 92. 1	46.8
Chicago.		

LOCKS.

Davis Island, - - - -	Ohio River, 80.2	40.4
Louisville, u. c., -	Ohio River, Louisville, 85.7	38.2
St. Mary's Falls Canal, u. c. -	Sault St. Marie, 84.4	46.5
Genl. O. M. Poe, 34 West Congress St., Detroit, and E. S. Wheeler, Sault St. Marie.		
Erie Canal, Lockport, - -	Lockport, N. Y., 78.8	42.9
Cascade Locks, u. c., -	Columbia River, Ore., 122.	45.6
Welland Canal, - - - -	- - - -	79.1 43.
Lachine Canal, - - - -	- - - -	74. 45.2
Locks and Canals on Merimack River,		
James Francis, Engineer.	Lowell, Mass., 71.2	42.6

AQUEDUCTS, DAMS AND RESERVOIRS.

New Croton Aqueduct, - - - -	- - - -	New York.
Sudbury River Aqueduct, -	Boston, Mass., 71.	42.4
Washington Aqueduct, -	Washington, D. C., 77.1	38.9
East Jersey Water Company, - - -	N. J., 74.2	40.8
Clemens Herschel, Engineer, No. 2 Wall St., New York.		
Hemlock Lake, - - - -	Rochester, N. Y., 77.7	43.1
E. Kuichling, Engineer.		
Chicago Water Works Cribs, - - -	- - -	Chicago, 87.6 41.8
Milwaukee Crib, u. c., -	Milwaukee, Wis., 87.9	43.
G. H. Benzenberg, Engineer.		
Irrigation Works, Riverside & Redlands, Cal.,	117.1	34.3
South Gila Canal Co.'s Dam and Irrigation Works, u. c.,		
John F. Ward, Engineer.	Sentinel, Arizona, 113.	32.8
Titicus Dam, - - -	Purdy's Station, N. Y., 73.9	41.1
Sodom Dam, - - -	- - -	Brewsters, N. Y., 73.8 41.2
Carmel Dam, u. c., - - -	- - -	Carmel, N. Y., 73.7 41.7
Holyoke Dam, - - -	- - -	Holyoke, Mass., 72.6 42.3
Austin Dam, - - -	- - -	Austin, Tex., 97.7 30.3
Davis Island, Movable, - - -	- - -	Ohio River, 80.2 40.4
Bear Valley Dam, - - -	- - -	Redlands, Cal., 117.1 34.3
Sweetwater Dam, - - -	- - -	San Diego, Cal., 116.9 32.7
Croton Reservoirs, -	Central Park, New York, 73.8	40.7
Chestnut Hill, - - -	- - -	Boston, 71. 42.4
East Park, - - -	- - -	Philadelphia, 75.1 40.



Ottawa and vicinity,	-	-	Ottawa, Canada,	76.6	45.4
Minneapolis,	-	-	Minneapolis, Minn.,	93.3	45.
Duluth,	-	-	Duluth, Minn.,	92.1	46.8

PAPER AND PULP MILLS.

Appleton,	-	-	-	-	Wis.,	88.4	44.3
Glenns Falls,	-	-	-	-	N. Y.,	73.8	43.2
Manayank,	-	-	-	-	Pa.,	75.2	40.
Niagara Falls,	-	-	-	-	N. Y.,	79.	43.1
On Line of Maine Central R. R., Maine,							
Holyoke,	-	-	-	-	Mass.,	72.6	42.3

OIL AND NATURAL GAS.

Pittsburgh field,	-	-	Pittsburgh, Pa	80.	40.4
Ohio and Indiana field,	-	-	Lima.	84.1	40.6
C. H. Cole, Lima Natural Gas Co.					

PHOSPHATE ROCK.

River and land dredging, near	CHARLESTON, S. C.	79 9	32.8
Florida phosphates, near	Ocala,	-	82.1 29.
O. G. Finch, Asst. Supt.			

MINES AND MINING.

COAL, Anthracite, P. & R.,				
	Pottsville and vicinity, Pa.,	76.4	40.6	
Coal, Anthracite, L. V. R. R.,	-	Mauch Chunk,	75.8	40.8
Coal, Anthracite, D. & H. R. R.				
Coal, Semi-Bituminous,	-	-	Clearfield, Pa.,	78.5 41.
Coal, Semi-Bituminous,	-	-	Mt. Pleasant, Pa.,	79.6 40.3
Coal, Semi-Bituminous,	-	-	-	Frostburg, Md.
B. S. Randolph, Supt. Tail Rope Hauling.				
Coal, Coking,	-	-	-	Scottdale, Pa., 79.8 40.
Coal, Bituminous, Ohio.				
Coal, Block, Indian,	-	-	-	Brazil, Ind., 86.7 39.7
Coal, Bituminous, Illinois.				
Coal, Bituminous, Alabama,	Birmingham, Ala.,	86.8	33.6	
Coal, Bituminous and Coke Plant,	Earlington, Ky.,	87.5	37.3	
John B. Atkinson.				

The first of these was the establishment of the first public school in the city, in 1630. This was the first of a long series of schools which have since been established in the city, and which have been the means of educating the children of the city, and of raising the level of education in the city. The first school was established in the year 1630, and was the first of a long series of schools which have since been established in the city, and which have been the means of educating the children of the city, and of raising the level of education in the city.

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Silver Mining and Smelting,	- Helena, Mont., 112.	46.7
Silver Mining and Smelting,	- Park City, Utah, 111.5	40.6
Silver Mining and Smelting,	Bingham, Utah, 112.	40.5
Silver Mining and Smelting,	- Eureka, Utah, 112.2	39.8

SILVER MILLING AND LEAD CONCENTRATION,

	De Lamar, Idaho, 115.9	47.5
"	" - - Virginia City, Nev., 119.7	39.8
"	" - - Pine Co. Ariz., 111.	32.4
"	" - Silver City, New Mexico, 108.2	32.5

ZINC MINING,

Franklin, N. J.,	74.1	40.8
La Salle, Ill.,	59.	41.2

For Kansas & South West Missouri Zinc and Lead Industry,
Apply to Kansas City Club,

Lead Mining, Non Argentiferous, St. Joseph, Mo.	94.8	39.8
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IRON MINING,

Cornwall Ore Beds,	- - Cornwall, Pa.	76.8	40.3
Lake Champlain Mines,			
S. B. McKee, Engineer,	- Mineville, N. Y.	73.4	44.1
Alabama Ores,	- - Birmingham, Ala.	86.8	33.6
Cranberry Ores,	- - Cranberry, N. C.	82.	36.2

LAKE SUPERIOR ORE BEDS,

Vermillion District, Minn.,	92.	47.3
Messabi, Minn.,	93.	47.4
Gogebic, Wisconsin,	91.5	46.4
Marquette, Michigan,	88.	46.5
Menominee, Mich.,	87.7	45.3

ORE SHIPPING PORTS,	Two Harbors, Minn.,	91.8	47.
	Duluth, Minn.,	92.1	46.8
	Ashland, Wisconsin,	90.9	46.6
	Marquette, Michigan,	87.3	46.8
	Escanaba, Michigan,	87.1	40.9

NOTE.—This Port ships 4,000,000 tons of ore annually.

ORE RECEIVING PORTS,	South Chicago, Ills.		
	Cleveland, Ohio,	81.7	41.4
	Fairport, Ohio,	81.2	41.8
	Ashtubula, Ohio,	80.9	41.8



Eden Park, - - - - -	Cincinnati, 84.6	39.1
Spring Valley, - - - - -	San Francisco, 122.4	37.4
Hydraulic Mining, - - - - -	Humboldt City, Nev., 116.3	40.6

DRAINAGE AND SEWERAGE.

Filtration Process, - - - - -	East Orange, N. J., 74.1	40 8
Precipitation Process, - - - - -	East Orange, N. J.	
Combined System, - - - - -	New York.	
Combined System, - - - - -	Philadelphia, Pa., 75.1	40.
Combined System, with pumping and tidal discharge, - - - - -	Boston, Mass., 71.	42.4
Separate System, - - - - -	Memphis, 90.	35 1
Pumping System, - - - - -	Chicago.	
Shone Pneumatic System, - - - - -	Exposition Grounds, Chicago.	
Cremation Process, - - - - -	Pencoyd Iron Works, Phila., 75.2	40.1

CANAL.

Chicago Main Drainage, - - - - -	Lemont, Ill., 88.	41.7
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WHARVES AND DOCKS.

Works of Dock Dept., u. c., East River, foot of East 24th St.		
A. McC. Parker.		
North River, u. c., - - - - -	Foot of Harrison St.	
E. Lentilhon.		
Wooden Dry Dock, - - - - -	Navy Yard, Brooklyn, 73.8	40.6
Erie Grain Dock, - - - - -	Erie Basin, Brooklyn, 73.7	40.4
Newport News, - - - - -	76.4	36.8
Port Royal Timber Dry Dock, u. c.,		
	Port Royal, S. C., 80.6	32.4
E. Diebitsch, Engineer.		
Sectional Floating Docks, East River, New York, 73.8		40.6

LUMBER MILLS.

Williamsport, - - - - -	Williamsport, Pa., 77.	41.2
Sinnemahoning Valley, - - - - -	Austin, Pa., 78.1	41.7
Tonawanda, - - - - -	Tonawanda, N. Y., 78.8	43.

COKE, H. C. Frick Coke Co.

J. H. Paddock, Engineer. VIA Pennsylvania R. R. stop at Greensburg; VIA B. & O. R. R. stop at Connellsville.

COPPER, Native, Mining and Concentration,

Keweenaw Point, Mich., 88.1 46.9

Copper, Silver-Bearing Sulphurets.**Copper and Silver Concentration and Smelting,**

Parker & Howe.

Great Falls, Mont., 111.2 47.6

Copper Concentrating and Smelting,

Butte, Mont., 112.6 46.1

Copper Oxidized Ores Smelting, Bisbee, Ariz., 109.8 31.6

Copper Oxidized Ores Smelting, Clifton, Ariz., 109.1 33.1

Copper Oxidized Ores Smelting, Globe, Ariz., 110.6 33.6

Copper Pyritous Ores, - - - - Louisa Co., Va.

Copper Burned for Sulphur, Capleton, Canada, 71.8 45.3

GOLD MINING.**Gold, Drift, River and Hydraulicig,**

Nevada Co., Cal., 121. 39.3

Gold, Drift, River and Hydraulicig,

Sierra Co., Cal., 120. 39.

Gold, Drift, River and Hydraulicig,

Placer Co., Cal., 121. 39.1

Gold Vein Mining, - - Nevada Co., Cal., 121. 39.3

Gold Vein Mining, - - Amador Co., Cal., 120.5 38.5

Gold Vein Mining, - - Trinity Co., Cal., 123. 40.8

Gold Vein Mining, - - Deadwood, S. Da., 103.8 44.2

Gold Dry Vanning, - - Fort Yuma, Cal., 114.5 32.8

Gold Dry Vanning, - - - Osceola, Nev., 114.3 39.1

Gold Region Geologically Interesting,

Cripple Creek, El Paso Co., Col., 105. 38.5

SILVER MINING AND SMELTING.

Silver Mining and Smelting, - Leadville, Col., 106.2 39.3

Silver Mining and Smelting, - Aspen, Col., 106.8 39.2

Silver Mining and Smelting, - Crede, Col., 106.5 37.7

Silver Mining and Smelting, Georgetown, Col., 105.1 39.

Silver Mining and Smelting, - Butte, Mont., 112.6. 46.1

THE HISTORY OF THE

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WOOD WORKING MACHINERY.

A. S. Woods Machine Co.,			
	172 High Street, Boston, Mass,	71.	42.3
Berry & Orton Co.,	Arch and 23d St., Phila, Pa.,	75.1	40.
J. A. Fay & Co.,	- - - Cincinnati, Ohio,	84.6	89.1
J. A. Fay & Eagan Co.,	- Cincinnati, Ohio.		

STEEL AND IRON COMPANIES.

Edgar Thomson Works,	- Bessemer, Pa.,	79.7	40.
Homestead Steel Works,	- Homestead, Pa.,	79.8	40.
Crescent Steel Co.,	- Pittsburgh, Pa.,	80	40.4
Illinois Steel Co.,	- - - Chicago, Ills.		
Otis Steel Co.,	- Cleveland, Ohio,	81.7	41.4
Cambria Steel Co.,	- Johnstown, Pa.,	78.9	40.3
Scranton Iron Co.,	- Scranton, Pa.,	75.7	41.4
Pennsylvania Steel Co.,	- Steelton, Pa.,	76.8	40.2
Bethlehem Iron Co.,	- Bethlehem, Pa.,	75.3	40.7
Maryland Steel Co.,	- Sparrows Point, Md.,	76.7	39.2
Chrome Steel Co.,	- Brooklyn, E. D.	73.7	40.6
Troy Bessemer Steel Works,	- Troy, N. Y.,	73.7	42.8

IRON AND STEEL MANUFACTURING.

Buffalo Forge Co.,	- - - Buffalo, N. Y.,	78.9	42.9
Cleveland City Forge Co.,	- Cleveland, Ohio,	81.7	41.4
N. J. Steel & Iron Co.,	- Trenton, N. J.,	74.8	40.2
Cornell Iron Works,	- - - New York.		
Jackson Iron Works,	- - - New York.		
Builders' Iron Foundry,	- Providence, R. I.,	71.3	41.7
F. R. Hawkins Iron Works,	Springfield, Mass.,	72.7	42.1

MACHINISTS.

Niles Tool Works Co.,	- Hamilton, Ohio,	84.6	39.4
Wm. H. Sellers & Co.,	- Philadelphia, Pa.,	75.1	40.
Bement Miles & Co.,	- Philadelphia,	75.1	40.
Brown & Sharpe Mfg. Co.,	- Providence, R. I.,	71.3	41.7
Schoen Mfg. Co.,	- Pittsburgh, Pa.,	80.	40.4
Billings & Spencer Co.,	- Hartford, Conn.,	72.7	41.7
Yale & Towne Mfg. Co.,	- Stamford, Conn.,	75.5	40.9

Silver Mining and Smelting,	- Helena, Mont., 112.	46.7
Silver Mining and Smelting,	- Park City, Utah, 111.5	40.6
Silver Mining and Smelting,	Bingham, Utah, 112.	40.5
Silver Mining and Smelting,	- Eureka, Utah, 112.2	39.8

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"	" - Silver City, New Mexico, 108.2	32.5

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	La Salle, Ill., 59.	41 2

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Menominee, Mich.,	87.7	45.3

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	Escanaba, Michigan,	87.1	40.9

NOTE.—This Port ships 4,000,000 tons of ore annually.

ORE RECEIVING PORTS,	South Chicago, Ills.		
	Cleveland, Ohio,	81.7	41.4
	Fairport, Ohio,	81.2	41.8
	Ashtubula, Ohio,	80.9	41 8

ASPHALT.

The Barber Asphalt and Paving Co.,	-	1 Broadway, N. Y.
Warren Scharf Paving Co.,	-	81 Fulton Street, N. Y.

ASTRONOMICAL TELESCOPES.

Alvin Clark & Sons,	-	Cambridgeport, Mass.,	71.	42 4
John Brashear,	-	Allegheny City, Pa.,	80.	40. 4

BRIDGE WORKS.

Berlin Iron Bridge Co.,	-	East Berlin, Conn.,	72.8	41.5
Detroit Bridge Works,	-	-	Detroit, Mich.,	83.1 42.2
Dominion Bridge Works,	-	Montreal, Canada,	73.6	45.4
Elmira Bridge Works,	-	-	Elmira, N. Y.,	76.9 42.
Edgemoor Bridge Works,	-	Wilmington, Del.,	75.5	39.7
Hamilton Bridge Works,	-	Hamilton, Ontario,	79.9	43.2
Keystone Bridge Co.,	-	-	Pittsburg, Pa.,	80. 40.4
King Bridge Co.,	-	-	Cleveland, Ohio,	81.7 41.4
Missouri Valley Bridge & Iron Works,		Leavenworth, Kansas,	95.	39.2
New Jersey Steel & Iron Co.,		Trenton, N. J.,	74 8	40 2
Passaic Rolling Mill Co.,	-	Paterson, N. J.,	74.1	40.8
Pittsburg Bridge Co.,	-	-	Pittsburg, Pa.,	80. 40.4
Pencoyd Iron Works,	-	-	Pencoyd, Pa.,	75.2 40.1
Phoenix Bridge Works,	-	Phoenixville, Pa.,	75.2	40.4
Rochester Bridge & Iron Works,		Rochester, N. Y.,	77.7	43.1
Schultz Bridge & Iron Co.,		Chartiers Station, Pittsburg, Pa.		
Shiffler Bridge Co.,	-	-	Pittsburgh, Pa.	.80 40.4
Union Bridge Co.,	-	-	Athens, Pa.,	76.6 41.9
Youngstown Bridge Co	-	Youngstown, Ohio,	80.7	41.1

GLASS WORKS.

Pittsburgh,	-	-	-	-	-	-	-	80.	40 4
Creighton, Pa.	-	-	-	-	-	-	-	80.	41.1
Corning, N. Y.,	-	-	-	-	-	-	-	77.	42.1

WATER TUBE BOILERS.

Abendroth & Root,	-	-	-	-	28 Cliff St., N. Y.
Babcock & Wilcox,	-	-	-	-	30 Cortlandt St., N. Y.
Alma Water Tube Boiler,	-				Providence, R. I., 71.3 41.7

DEPARTMENT OF CHEMISTRY

RESEARCH REPORT

NO. 100

BY J. H. HARRIS AND R. W. BARTON

THE CHEMISTRY OF

THE HYDROLYSIS OF CERTAIN

ESTERS OF CERTAIN ACIDS

AND THE EFFECT OF

TEMPERATURE ON THE

RATE OF REACTION

IN AQUEOUS SOLUTION

AT VARIOUS PRESSURES

AND IN THE PRESENCE

OF CERTAIN SALTS

AND OF CERTAIN

ORGANIC SUBSTANCES

AND OF CERTAIN

INORGANIC SUBSTANCES

AND OF CERTAIN

PHYSICAL FACTORS

AND OF CERTAIN

CHEMICAL FACTORS

AND OF CERTAIN

PHYSICAL FACTORS

The Dixon Mfg. Co.,	- - -	Scranton, Pa.,	75.7	41.4
Acme Machinery Co.,	- - -	Cleveland, Ohio,	81.7	41.4
The Ingersoll Milling Machine Co.,		Rockford, Ill.,	89.	42.3
Ferracute Machine Co.,	- - -	Bridgeton, N. J.,	75.2	39.3

ELECTRIC COMPANIES.

Edison Illuminating Company's Station,				
		Pearl Street corner of Elm,	N. Y.	
Westinghouse Electric Company,		Pittsburgh, Pa.,	80.	40.4
General Electric Company,				
44 Broad St., New York, and Schenectady,		N. Y.,	74.	42.8
Houston Thomson Company,		44 Broad St., New York.		
Crocker Wheeler Company,				
		Ampire, N. J., near Newark,	74.1	40.6

REFRIGERATING MACHINERY.

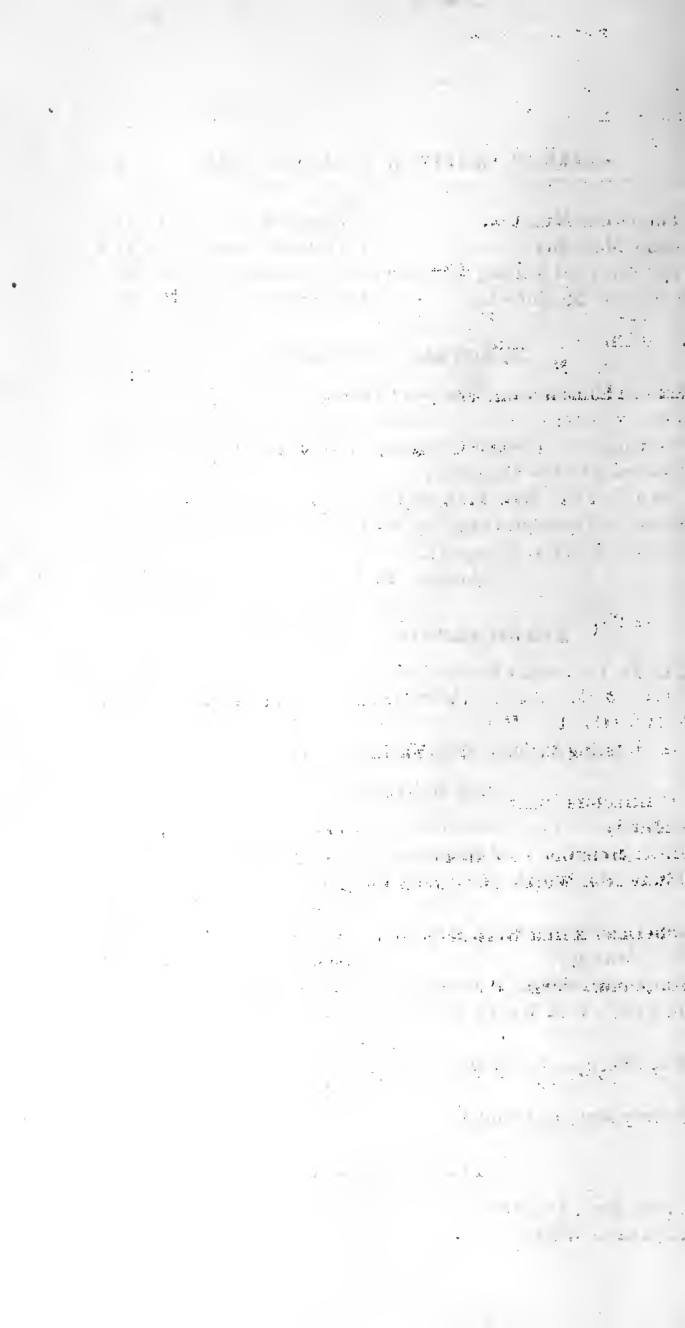
The De La Vergne Refrigerating Co.,				
		(Mott Haven) foot East 138th st.,	N. Y.	

ELEVATORS, CONVEYING AND HOISTING
MACHINERY, ETC.

Otis Bros. & Co., Elevators,	- - -	26 and 38 Park Row,	N. Y.	
C. W. Hunt Co., Coal Handling Machinery,		45 Broadway,	N. Y.	
Brown Hoisting & Conveying Machine Co.,				
		Cleveland, Ohio,	81.7	41.4
The Contractors Plant Mfg. Co.,		Buffalo, N. Y.,	78.9	42.9
J. S. Mundy,	- - -	Newark, N. J.,	74.1	40.8
American Hoisting & Derrick Co.,		St. Paul, Minn.	93.3	45.
Bay State Iron Works, Hoisting Machinery,				
		Erie, Pa.,	80.	42.1
The Sherman Aerial Hoisting & Distributing Co.,				
		85 Ninth Street,	Brooklyn.	
Jeffrey Manufacturing Co.,	- - -	Columbus, Ohio,	83.	40.

PILE DRIVERS.

Crams Steel Pile Driver,	- - -	Detroit, Mich.,	83.1	42.2
Industrial Works,	- - -	Bay City, Mich.,	83.9	43.4



DREDGES AND EXCAVATORS.

Osgood Dredge Co.,	- - -	Albany, N. Y.,	73.7	42.8
J. H. Lancaster, Hoisters and Grapples,		41 Cortlandt St., N. Y.		
The Vulcan Iron Works,	- - -	Toledo, Ohio,	83.5	41.6
Marion Steam Shovel Co.,	- - -	Marion, Ohio,	83.2	40.5
Industrial Works,	- - -	Bay City, Mich.,	83.9	43.4
Bucyrus Steam Shovel & Dredge Co.,		South Milwaukee, Wis.,	87.9	43.1

DRILLS AND MINING MACHINERY.

Fraser & Chalmers,	- - - - -	Chicago, Ills.		
Ingersoll-Seargant Drill Co.,	- - - - -	Havermeyer Bldg., N. Y.		
Rand Drill Co.,	- - - - -	21 Park Place, N. Y.		
Steam Stone Channeling Co.,	- - - - -	Rutland, Vt.,	73.	43.6
Jeffery Mfg. Co.,	- - - - -	Columbus, Ohio,	83.	40.
H. B. Simpson,	- - - - -	Scranton, Pa.,	75.7	41.4
Norwalk Iron Works Co., Air Compressors,		South Norwalk, Conn.,	73.3	41.
Oil Well Supply Co.,	- - - - -	Pittsburg, Pa.		

NOTE —Nearly all appliances for quarrying and handling stone can be seen working on the main drainage canal near Chicago.

QUARRIES.

Marble Quarries,	- - - - -	Rutland, Vt.,	73.	43.6
Marble Quarries,	- - - - -	Knoxville, Tenn.,	83.9	36.
Granite Quarries,	- - - - -	West Quincy, Mass.,	71.	42.3
Granite Quarries,	- - - - -	Rockport, Mass.,	70.7	42.6
Granite Quarries,	- - - - -	Rockland, Maine,	69.	42.1
Granite Quarries,	- - - - -	Leet's Island, Conn.,	73.	41.
Brown Stone Quarries,	- - - - -	Cromwell, Conn.,	72.6	41.5
Sandstone,	- - - - -	Cleveland, Ohio,	81.7	41.4
Slate,	- - - - -	Penhryn, N. Y.,	73.2	43.3
Limestone,	- - - - -	Greensburg, Ind.,	85.5	39.4
Oolitic Limestone,	- - - - -	Bedford, Ind.,	86.5	38.8

A special list of quarries using improved machinery will be furnished on application.



NATURAL CEMENTS.

F. O. Norton & Co.,	- - - -	Binnewater	
N. Y. & Rosendale Cement Co.,	-	Rosendale, N. Y.	
Lawrence Cement Co.,	- - - -	Rosendale, N. Y.	

The above cements are made near Kingston, N. Y. Edward B. Codwise, City Engineer, will give visitors directions for reaching the various works.

The Louisville Cement Co.,	-	Louisville, Ky.	85.8	38.3
Milwaukee Cement Co.,	-	Milwaukee, Wis.,	87.9	43.1
Cumberland Cement Co.,		Cumberland, Md.,	78.8	39.7

FOUNDATIONS.

SooySmith Co., Compressed Air,	-	66 Broadway, N. Y.	
Geo. E. Thomas, Supt.			

FIRE CLAY & BRICK MACHINERY.

Calumet Fire Clay Co.,	-	Calumet, Jefferson Co., Ohio.	
E. M. Freese & Co.,			

Clay Working Machinery,	-	Galion, Ohio,	82.8	40.7
The Union Mining Co., Mt. Savage Fire-Bricks Works,				
		Mt. Savage, Md.,	78.9	39.9

RAILROAD SIGNALS.

Johnson Railroad Signal Co.,	-	Rahway, N. J.,	73.3	40.5
Kinsman Block System Co.,	- -	96 Broadway, N. Y.		
Union Switch & Signal Co.,	-	Pittsburgh, Pa.,	80.	40.4

VALVES.

Ludlow Valve Co.,	- - - -	Troy, N. Y.,	73.6	42.9
Chapman Valve Co.,	- - - -	Indian Orchard, Mass.		

CAR WHEELS.

Allen Paper Car Wheel Co., Hudson, N. Y.,	73.6,	42.4
	and Pullman, Ills.,	87.6 41.6
New York Car Wheel Works, - Buffalo, N. Y.,	78.9	42.9



Ramapo Wheel & Foundry Co.,	Ramapo, N. Y.,	7.46	41.1
Lobdell Car & Wheel Co.,	- Wilmington, Del.,	75.5	39.7
A. Whitney & Sons,	- - Philadelphia, Pa.,	75.1	40.
St. Charles Car Co.,	- - St. Charles, Mo.,	90.5	38.7

STREET CARS.

John Stephenson Co.,	- - - - -	New York.	
J. G. Brill,	- - - - Philadelphia, Pa.,	75.1	40.
Murphy & Allison,	- - - - -	Philadelphia.	
Laclede Company,	- - - St. Louis, Mo.,	90.2	38.6
Pullman Palace Car Co.,	- - Pullman, Ills.,	87.6	41.8

RAILROAD CARS.

St. Charles Car Co.,	- - - St. Charles, Mo.,	90.5	38.7
Harlan & Hollingsworth Co.,	Wilmington, Del.,	75.5	39.7
Jackson Sharp Co.,	- - - - -	Wilmington, Del.	
Gilbert Car Co.,	- - - - -	Troy, N. Y.,	73.7 42.8
Jeffersonville Car Co.,	- - - Jeffersonville, Ind.,	85.7	38.2
Pullman Car Co.,	- - - - -	Pullman, Ills.,	87.6 41.8
Barney Smith Co.,	- - - - -	Dayton, O.,	84.1 39.8
Watson Car Co.,	- - - - -	Pittsfield, Mass.,	73.2 42.4
Madison Car Works,	- - - - -	Madison, Ills.,	90.2 38.7

ROAD MACHINES.

American Road Machine Co.,	Kennett Square, Pa.,	75.6	40.
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ROAD ROLLERS.

The O. S. Kelly Co.,	Springfield, Ohio.,	-	84.1 40.1
Harrisburgh Foundry & Machine Works,			
	Harrisburgh, Pa.,	76.8	40.3

LOCOMOTIVES.

Richmond Locomotive Machine Works,			
	Richmond, Va.,	77.4	37.5
Dixon Mfg. Co.,	Seranton, Pa.,	- - -	75.7 41.4

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Baldwin Locomotive Works,	Philadelphia, Pa.,	75.1	40.
H. K. Porter & Co.,	- - -	Pittsburg, Pa.,	80.1 40.4
Schenectady Locomotive Works,			
	Schenectady, N. Y.,	74.	42.8
Cooke Locomotive & Machine Co.,	Paterson, N. J.,	74.1	40.8
Brooks Locomotive Works,	Dunkirk, N. Y.,	- 79.4	42.5
Rhode Island Locomotive Works,			
	Providence, R. I.,	71.3	41.7
Pittsburgh Locomotive Works,	Allegheny, Pa.,	80.1	40.4

SNOW PLOWS.

The Jull Centrifugal Snow Excavator is manufactured			
by the Rogers Locomotive Works,			
	Paterson, N. J.,	74.1	49.8

PUMPS AND WATER WHEELS.

Pelton Water Wheel Co.,	- - -	San Francisco, Cal.	
James Leffel & Co.,	Springfield, Ohio,	- - -	84.1 40.1
Jos. Edwards & Co.,	Centrifugal Pumps,	412 Water st., N. Y.	
Baldwinville Centrifugal Pumps,	Syracuse, N. Y.,	76.1	40.3
Worthington Pump Co.,	- - -	86 Liberty st., N. Y.	
Cameron Steam Pump Works,	- - -	Foot East 23rd st., N. Y.	
Knowles Steam Pump Works,	- - -	93 Liberty st., N. Y.	
Davidson Pump Works,	- - -	Brooklyn E. D.,	73.7 40.6
The Gordon Steam Pump Co.,	Hamilton, Ohio,	89.6	39.4
Laidlaw & Dunn Co.,	Cincinnati, Ohio,	- 84.6	39.1
Edw. P. Allis & Co.,	- - -	Milwaukee, Wis.,	87.9 43.1

CREOSOTING.

Eppinger & Russel Creosoting Works,	- 66 Broad st., N. Y.		
Lehigh Valley Creosoting Works,			
	Perth Amboy, N. J.,	74.1	40.5



SHIP BUILDING AND SHIP'S ENGINES.

Harlan & Hollingsworth Co.,	Wilmington, Del.,	75.5	39.7
Delaware River Iron Ship Bldg's Works,			
	Chester, Pa.,	75.3	39.8
Newport News Ship Building & Dry Dock Co.,			
	Newport News, Va.,	76.4	36.8
Wm. Cramp & Sons' Ship & Engine bldg.,			
	Phila., Pa.,	75.3	39.8
The Neafie & Levy Ship Bldg. Co.,	Philadelphia, Pa.,	75.1	40.
The Bath Iron Works,	- - - Bath, Maine.	69.9	43.9
Morgan Iron Works,	- - - 9th st. & East River, N. Y.		
Quintard Iron Works,	- - - 12th st. & East River.		
Continental Iron Works,	Greenpoint, N. Y.,	73.7	40.7
Globe Iron Works,	Cleveland, Ohio,	- - 81.7	41.4
Detroit Dry Dock Co.,	Detroit, Michigan,	- - 83.1	42.2
Samuel F. Hodge & Co.,	Detroit, Mich.,	- 83.1	42.2
F. W. Wheeler & Co.,	West Bay City, Mich.,	- 83.9	43.4
Chicago Ship Building Co.,	313 Rookery bldg., Chicago, Ills.		
Union Iron Works,	- San Francisco, Cal.,	122.5	37.6
Whaleback Yard,	- - West Superior, Wis.,	92.2	46.6
Herrishoff Yard,	- - - Bristol, R. I.,	71.	41.6

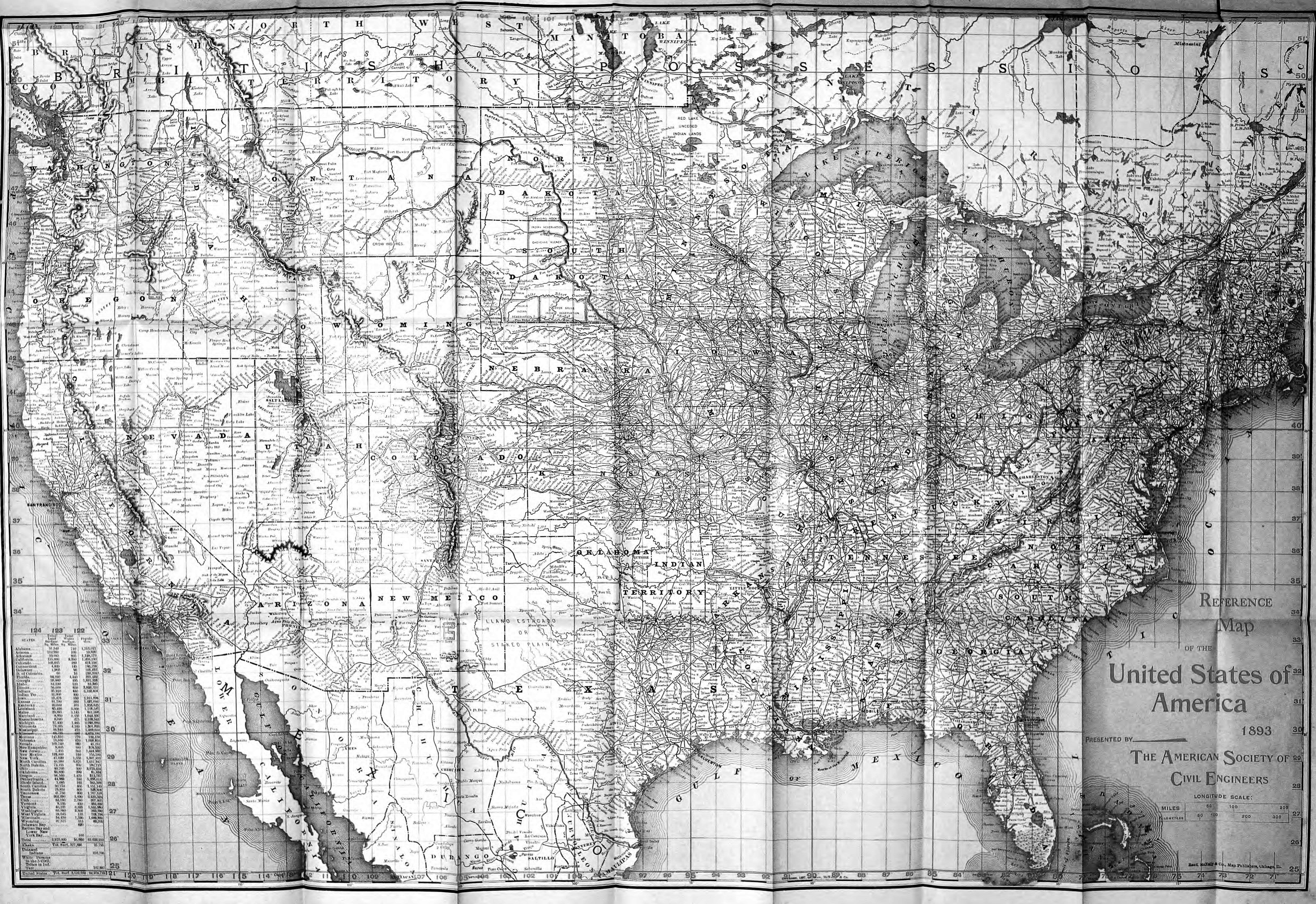
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STATES	Total	Land	Water	Population
Alabama	52,500	49,000	3,500	1,210,000
Alaska	112,000	100,000	12,000	13,000
Arizona	23,000	22,000	1,000	118,000
Arkansas	35,000	34,000	1,000	1,000,000
California	150,000	145,000	5,000	1,000,000
Colorado	35,000	34,000	1,000	118,000
Connecticut	3,500	3,500	0	1,000,000
Delaware	1,500	1,500	0	1,000,000
D. of Columbia	0	0	0	1,000,000
Florida	55,000	54,000	1,000	1,000,000
Georgia	35,000	34,000	1,000	1,000,000
Idaho	23,000	22,000	1,000	118,000
Illinois	100,000	99,000	1,000	1,000,000
Indiana	35,000	34,000	1,000	1,000,000
Iowa	35,000	34,000	1,000	1,000,000
Kansas	35,000	34,000	1,000	1,000,000
Kentucky	35,000	34,000	1,000	1,000,000
Louisiana	35,000	34,000	1,000	1,000,000
Maine	35,000	34,000	1,000	1,000,000
Maryland	35,000	34,000	1,000	1,000,000
Massachusetts	35,000	34,000	1,000	1,000,000
Michigan	35,000	34,000	1,000	1,000,000
Minnesota	35,000	34,000	1,000	1,000,000
Mississippi	35,000	34,000	1,000	1,000,000
Missouri	35,000	34,000	1,000	1,000,000
Montana	35,000	34,000	1,000	1,000,000
Nebraska	35,000	34,000	1,000	1,000,000
Nevada	35,000	34,000	1,000	1,000,000
New Hampshire	35,000	34,000	1,000	1,000,000
New Jersey	35,000	34,000	1,000	1,000,000
New Mexico	35,000	34,000	1,000	1,000,000
New York	35,000	34,000	1,000	1,000,000
North Carolina	35,000	34,000	1,000	1,000,000
North Dakota	35,000	34,000	1,000	1,000,000
Oklahoma	35,000	34,000	1,000	1,000,000
Oregon	35,000	34,000	1,000	1,000,000
Rhode Island	35,000	34,000	1,000	1,000,000
South Carolina	35,000	34,000	1,000	1,000,000
South Dakota	35,000	34,000	1,000	1,000,000
Texas	35,000	34,000	1,000	1,000,000
Vermont	35,000	34,000	1,000	1,000,000
Virginia	35,000	34,000	1,000	1,000,000
Washington	35,000	34,000	1,000	1,000,000
West Virginia	35,000	34,000	1,000	1,000,000
Wisconsin	35,000	34,000	1,000	1,000,000
Wyoming	35,000	34,000	1,000	1,000,000
Lower New York	35,000	34,000	1,000	1,000,000
Total	3,920,000	3,800,000	120,000	62,000,000

REFERENCE
Map
OF THE
**United States of
America**
1893
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